

# Under the Big Sky e-Letter

## March 2017

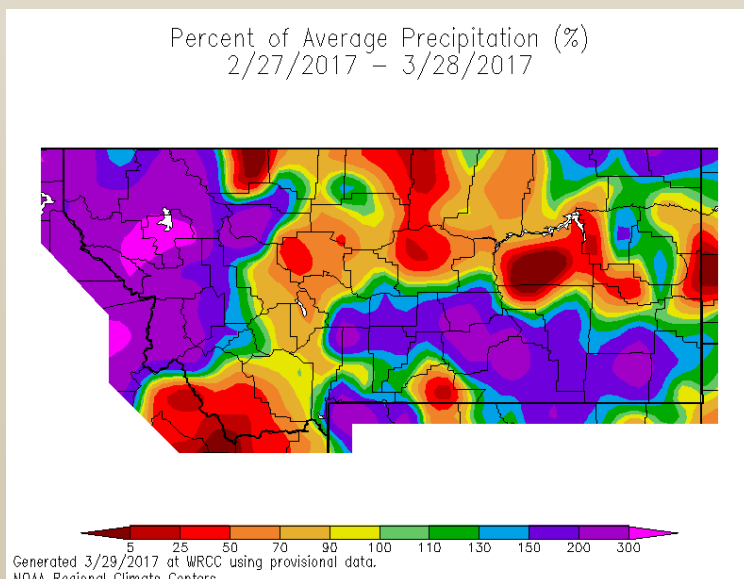


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**Snowmelt & Ice Jam Flooding 2017:** The month of March brought with it no shortage of hydrology issues to northeast Montana as a combination of snowmelt and ice jams have led to rises on rivers and streams and area flooding. In fact, it was the Big Muddy Creek near Antelope, MT experienced a record flood. The water level reached 17.89 ft, beating the old record from April 14, 1982 of 17.37 ft. Additionally, Daniels County had an emergency declaration from flooding. The Frenchman Creek in Phillips County reached Minor Flood Stage this season. As we flip the calendar over to April however, all flood warnings & advisories have passed us by and areas in northeast Montana have seen improving conditions and lowering water levels on creeks, streams, and rivers.

### 30 Day Percent of Normal Precipitation (Montana)



The 30-day percent of normal precipitation map of Montana appears in the figure to the left. Western Montana has observed well above average precipitation as well as portions of southeast Montana. Far northeast Montana along the Canadian border also saw above average precipitation over the last 30 days. Southwest Garfield County extending into North Central has experienced precipitation trends well below what would be considered average over the last 30 days.

Figure 1: 30-Day Percent of Normal Precipitation.

**CPC Three Month Outlook:** The Climate Prediction Center released its three month outlook for temperature and precipitation for April through June on March 16, 2017. The three month outlook calls for an equal chance for above or below normal temperatures for the entire state of Montana. Expectations are for above normal precipitation for the next three months. Those with interests in the general agriculture and/or this year's growing season, as well as those involved in calving should monitor updates to the outlook for changes. The latest outlook is always available [here](#) for anyone curious about additional details.

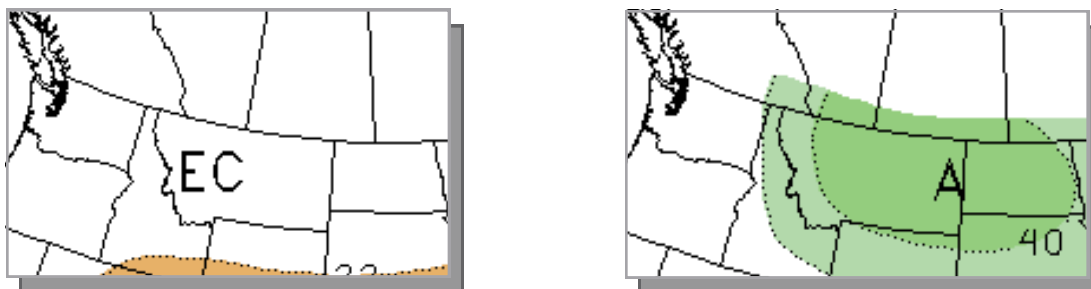


Figure 2: Climate Prediction Center three month temperature (left) and precipitation (right) outlook for April through June 2017.

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**Updated U.S. Drought Monitor:** The [latest U.S. Drought Monitor](#) was released on Thursday March 23, 2017. California continues to experience drought relief thanks to an abundance of precipitation in recent months. Much of Montana is void of drought conditions; however, there are patchy abnormally dry conditions across the state. Far southeast Montana is experiencing moderate drought at this time. Given above normal precipitation expected over the next three months, these conditions may see improvement in the months ahead.

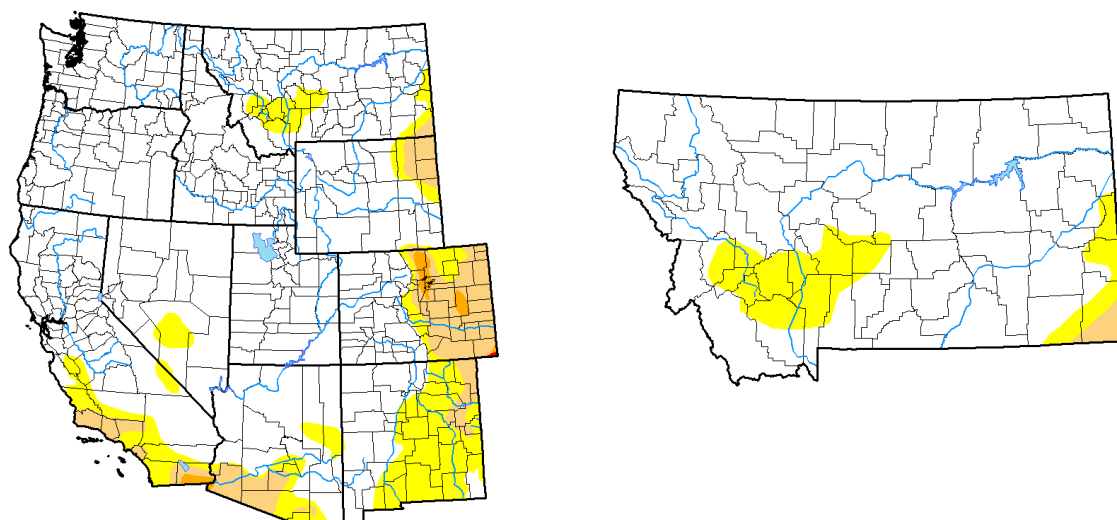


Figure 3: Latest Drought Monitor for the western U.S. (left) and Montana (right) released Thursday March 23, 2017.

**U.S. & Global Climate Highlights (February 2017):** The latest [U.S.](#) and [global](#) climate highlights for February 2017 are now available. A few points for you to take home are provided below.

## U.S. Selected Significant Climate Anomalies and Events for February 2017

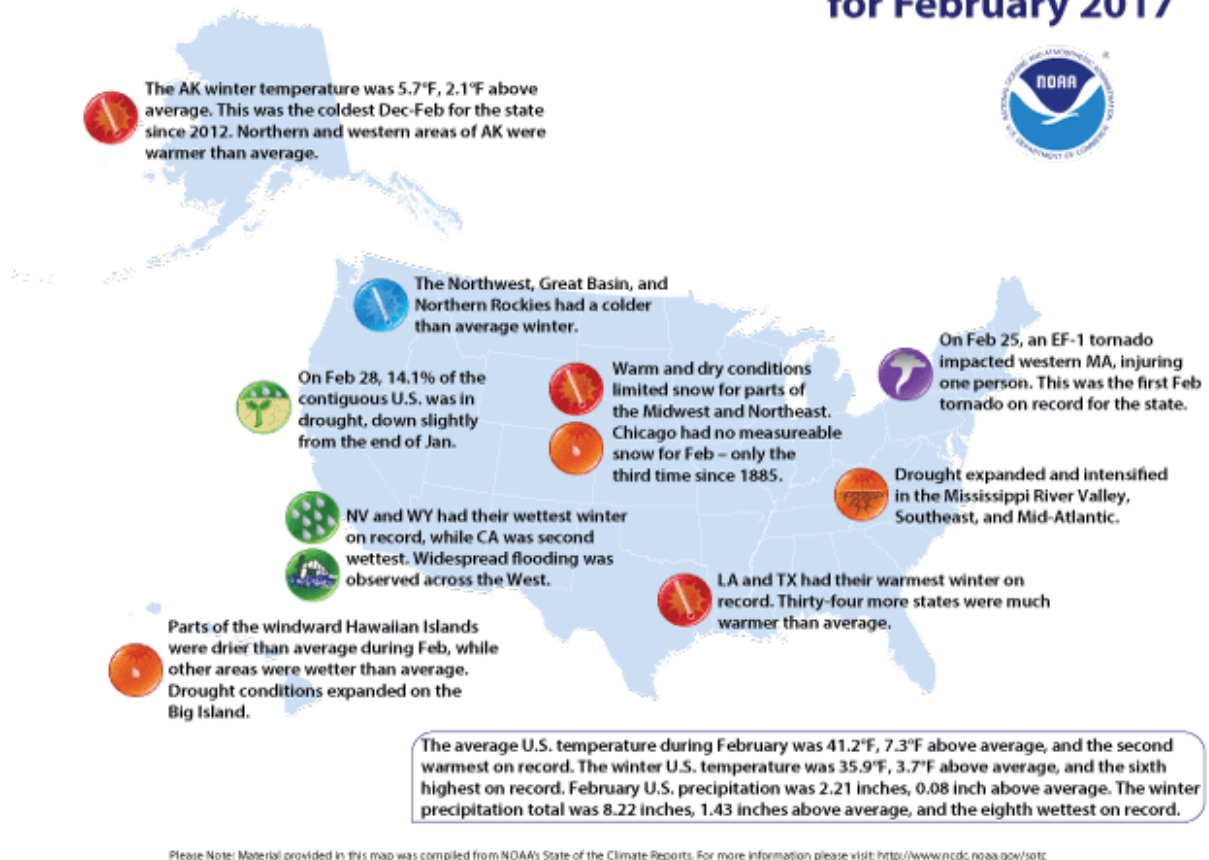


Figure 4: Highlights of U.S. climate events for February 2017.

### U.S. Highlights for February 2017

- 1) The contiguous U.S. average temperature for February 2017 was 41.2 °F, the 2nd warmest February in the 123-year record.
- 2) The average February precipitation total for the contiguous U.S. came in at 2.21 inches, or 0.08 inch above normal.
- 3) According to the U.S. Drought Monitor, 14.1% of the contiguous U.S. was in drought.

### Global Highlights for February 2017

- 1) The average temperature across global land and ocean surfaces for February 2017 was the 2nd warmest February in the entire period of record.
- 2) The February globally averaged sea surface temperature was 1.24°F above the 20th century average. This is the second highest global ocean temperature for February throughout the period of record.
- 3) ENSO neutral conditions were present in February 2017 and are now expected to continue into the fall.

## February Report of Hydrologic Conditions by Greg Forrester, Lead Forecaster at NWS Glasgow:

February was a warmer than normal month across northeast Montana. Temperatures were 2 to 6 degrees above normal across the region. Glasgow averaged 22.8 degrees which was 3.6 degrees above normal.

Precipitation was generally above normal. The wet spots were Zortman with 1.26 inches, Opheim 10N with 0.85 inch, and Raymond with 0.81 inch. The dry spots were Hoyt with 0.02 inch, Mosby with 0.12 inch, and Wibaux with 0.20 inch. Glasgow received 0.55 inch which was 212 percent of normal.

Unseasonably warm temperatures during the middle of the month melted most of the snow cover across the region and brought rising water and ice jams to rivers. Notable ice jams included the Mussellshell River between February 11 and 14, the Milk and Yellowstone Rivers between February 19 and 24. Snowmelt runoff brought minor flooding to Frenchman Creek in Northern Phillips County and nearby areas of southern Saskatchewan between February 20 and 23. Big Muddy Creek rose to within one foot of flood stage near Antelope on February 21 and 22.

The ice broke up on most of the Yellowstone Rivers between February 19 and 23. It remained frozen downstream from Sidney at the end of the month. The Milk and Poplar Rivers partially broke up at the same time and they remained partially frozen at the end of the month. The Missouri River remained frozen the entire month. Stream flow information is not available.

The Fort Peck Reservoir elevation rose to 2234.9 feet. The reservoir was at 81 percent of capacity and 101 percent of the mean pool.

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### Links You May Like:

[Ocean Acidification in the Arctic: Spreading Like Wildfire](#)

[California Sees Superbloom of Wildflowers](#)

[Winter Outlook 2017: Evaluation Time!](#)

[Arctic/Antarctic Sea Ice Maximum & Minimum Set Record Lows](#)

[Late Winter Wildfires in March 2017](#)

[Coldest & Warmest First Days of Spring in U.S.](#)

[March 2017 ENSO Update](#)

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**CANL Reminder** Spring has sprung! That means calving season is back again. This time of year the weather can be tricky with large swings in temperature, snow, rain, and everything in between. There's a product we have called the Cold Advisory for Newborn Livestock (CANL) to help you stay prepared and protect your newborn livestock from harsh early spring weather conditions. Check it out [here](#).

**Latest Skywarn Schedule:** [Here](#) you can see the very latest Skywarn spotter training schedule! If you'd like to become a new spotter for NWS Glasgow and report some ground truth to help our team with warning decision making and verification, consider attending one of these sessions! You can also find the very updated schedule on our main website and social media as well.

### Precipitation Data (February 2017):

Station	Precipitation	Location
BAYM8	0.40	Baylor
BRDM8	0.54	Bredette
BTNM8	0.31	Brockton 17 N
BKNM8	0.49	Brockton 20 S
BKYM8	0.23	Brockway 3 WSW
BRSM8	0.29	Brusette
CLLM8	0.56	Carlyle 13 NW
CIRM8	0.55	Circle
CHNM8	0.24	Cohagen
COHM8	M	Cohagen 22 SE
CNTM8	0.50	Content 3 SSE
CULM8	0.46	Culbertson
DSNM8	0.37	Dodson 11 N
FLTM8	0.30	Flatwillow 4 ENE
FPKM8	0.40	Fort Peck PP
GLAM8	0.30	Glasgow 14 NW
GGWM8	0.55	Glasgow WFO
GGSM8	0.60	Glasgow 46 SW
GNDM8	0.50	Glendive WTP
GSRM8	M	Grassrange 13 NE
HRBM8	M	Harb
HINM8	0.43	Hinsdale 4 SW
HNSM8	0.26	Hinsdale 21 SW
HOMM8	M	Homestead 5 SE
HOYM8	0.02	Hoyt
JORM8	M	Jordan
LNDM8	0.70	Lindsay
MLAM8	0.59	Malta
MLTM8	0.56	Malta 7 E
MTAM8	0.71	Malta 35 S
MDCM8	0.34	Medicine Lake 3 SE
MLDM8	0.29	Mildred 5 N

Station	Precipitation	Location
MSBM8	0.12	Mosby 4 ENE
OPNM8	0.85	Opheim 10 N
OPMM8	0.44	Opheim 12 SSE
PTYM8	0.66	Plentywood
POGM8	0.29	Port of Morgan
RAYM8	0.81	Raymond Border Station
SAOM8	0.54	Saco 1 NNW
SMIM8	0.16	St. Marie
SAVM8	0.30	Savage
SCOM8	0.42	Scobey 4 NW
SDYM8	0.42	Sidney
SIDM8	0.33	Sidney 2S
TERM8	0.38	Terry
TYNM8	M	Terry 21 NNW
VIDM8	0.26	Vida 6 NE
WSBM8	0.58	Westby
WTRM8	0.36	Whitewater
WHIM8	M	Whitewater 18 NE
WBXM8	0.20	Wibaux 2 E
WNEM8	0.33	Winnett 6 NNE
WNTM8	0.32	Winnett 8 ESE
WITM8	0.38	Winnett 12 SW
WLFM8	0.28	Wolf Point
ZRTM8	1.26	Zortman

**Monthly Trivia:** Last month we asked...

What is the relationship between the Fahrenheit and Celsius temperature scale?

**Answer:** Celsius is the standard scale to measure the temperature in most locations outside of the United States. It assumes the freezing point of water is 0 °C and the boiling point is 100 °C. In the United States, the Fahrenheit scale is more commonly used with a freezing point of water at 32 °F and boiling point at 212 °F.

You can easily convert from one scale to the other. If you have the temperature in Celsius and you wish to convert it to Fahrenheit, simply multiply it by 1.8 and add 32. For example:

$$T^{\circ}\text{F} = 1.8*(T^{\circ}\text{C})+32 \text{ (general formula)}$$

$$\text{So at } 100^{\circ}\text{C}, T^{\circ}\text{F} = 1.8*(100)+32$$

$$= 180+32$$

$$= \mathbf{212^{\circ}\text{F}}$$

**?** **New Question:** Severe weather season is on the way once again for northeast Montana. Do you know the difference between a watch and a warning? An important reminder will be featured in next month's newsletter!

### March 2017 Summary (Glasgow, MT)

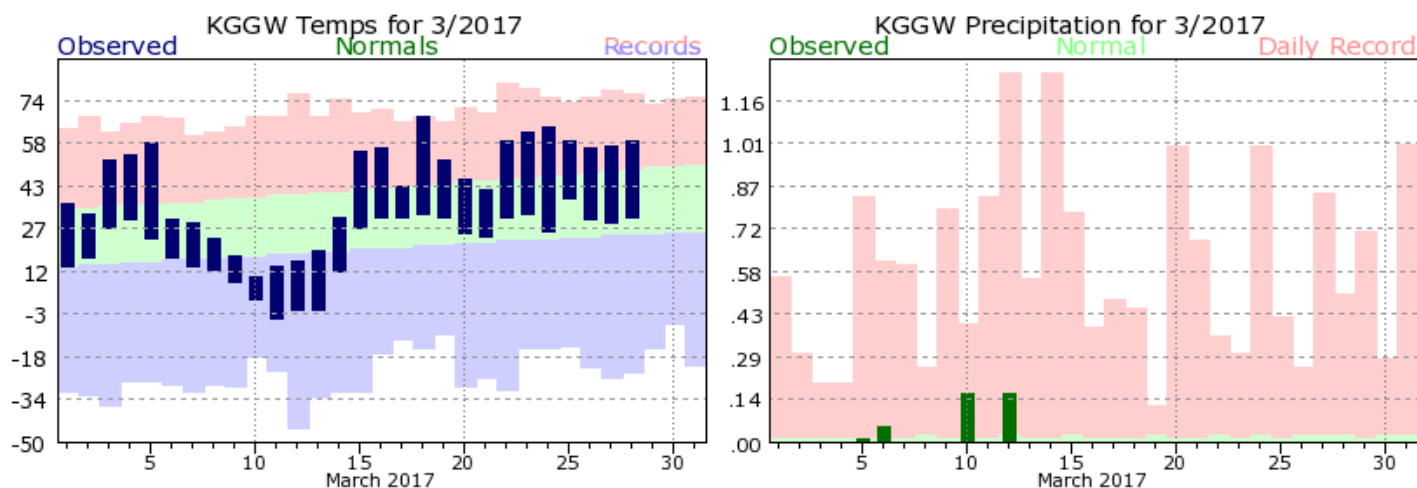


Figure 5: Observed temperatures for Glasgow relative to records and normal (left) and observed precipitation for Glasgow relative to records and normal (right) in March 2017.

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